**III. Amendment to the Claims.**

1. (Original) A continuous process for producing charcoal from biomass input material in which the production of charcoal is maximized and the consumption of charcoal is minimized, the process comprising the steps of:

a. establishing a charcoal production bed having a biomass upper layer having a top and a charcoal lower layer having a lower layer top; an intermediate layer pyrolysis zone positioned between the upper layer and the lower layer; the charcoal production bed positioned in a single reaction chamber;

b. igniting the lower layer top with ignition means; establishing a pyrolysis zone at the intermediate layer;

c. moving oxygen-containing gas downwardly through the charcoal production bed to sustain the pyrolysis reaction in the intermediate layer and to maintain the temperature of the charcoal in the lower layer, wherein the pyrolysis volatiles from the intermediate layer move downwardly through the hot charcoal in the lower layer, resulting in tar-free fuel gas, which exits from the outlet means, and;

c. removing, by removing means, charcoal in the lower layer; regulating the introduction of additional biomass material so that as charcoal is removed, the level of charcoal comprising the lower layer, and hence the level of the pyrolysis zone comprising the intermediate layer, remain substantially constant within the reaction chamber.

2. (Original) The process of claim 1, wherein:

a. maintaining the lower layer at a temperature which is sufficiently high to reduce any tars from the pyrolysis zone intermediate layer to carbon monoxide, hydrogen;

c. providing the charcoal production bed with an outlet means for fuel gas; regulating the additional biomass material by regulating at least the quantity and or the

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moisture content of the additional biomass material.

3. (Original) The process of claim 2, including the step of monitoring the level of the pyrolysis zone in the reaction chamber.

4. (Original) The process of claim 3 wherein the monitoring of the level of the pyrolysis zone in the reaction chamber is by thermocouple means.

5. (Original) The process of claim 2, including the step of removing the fuel gas from the reaction chamber.

6. (Original) The process of claim 1, wherein the temperature of the pyrolysis reaction zone is in the range of 800.degree. C.-1000.degree.

7. (Original) The process of claim 1, wherein the charcoal lower layer is substantially devolatilized.

8. (Original) The process of claim 1, wherein the charcoal lower layer is substantially uniform in size.

9. (Original) The process of claim 2, wherein:

a. establishing the charcoal production bed is commenced by adding a charge of charcoal at the lower layer of the reaction chamber.

10. (Currently amended) An apparatus for the production of fuel gas comprising:

a. a reaction chamber receiving biomass, including organic matter, thereby establishing a charcoal production bed; the charcoal production bed having a biomass upper layer having a top and a charcoal lower layer having a lower layer top; an intermediate layer pyrolysis zone positioned between the upper layer and the lower layer; the charcoal production bed positioned in a single reaction chamber, a pyrolysis zone established at the intermediate layer; tar-free fuel gas (44) produced as pyrolysis volatiles from an intermediate layer move downwardly through hot charcoal in the lower layer which exits from outlet means;

b. fuel gas (44) output is directed into a heat exchanger means (60) at a heat exchanger tank (60); heat exchanger tank (60) exhaust via a heat exchanger tank exhaust (71);

c. heat exchanger tank exhaust (71) is directed into a demister means (80) at a demister input (81); demister means (80) accumulates condensate (83); a demister output (82) is directed into a fuel conditioner means input (110), through a bubble forming means (115) and into and through a fuel conditioner means (100) containing fuel means (120); the fuel conditioner output (130) is exhausted via pump means (140) exerting a vacuum at the fuel conditioner output (130); fuel conditioner output (130) is directed to a storage or combustion at an engine means (160).

11. (Original) An apparatus of claim 10 further comprising:

a. having water or coolant supply inlet (67) and water or coolant discharge (69); heat exchanger tank (60) containing water (65); fuel gas (44) bubbled through the water (65) and exhausted from the heat exchanger tank (60) at the heat exchanger tank exhaust (71);

b. demister means (80) is comprised of a demister tank (87) with a demister input

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(81) comprised of at least one tube (81) extending downardly toward a condensate (83) collector (85);

c. the fuel conditioner means (100) containes fuel means (120); bubble forming means (115) is provided by directing the fuel conditioner input means (110) via pipe or tube means (110) to and through a grid (116)formed of fine wire mesh or a plate with at least one aperture (117); the bubble forming means (115) is submerged beneath a fuel means (120) surface (125).

12. (Original) An apparatus of claim 11 further comprising:

a. heat exchanger means (60) is supplemented by a supplemental heat exchanger means (62); said supplemental heat exchanger means (62) is positioned within the heat exchanger tank (60) and is in fluid contact with the heat exchanger water or fluid content (65);

b. the at least one tube (81) is comprised of a plurality of tubes 1...n (81); the condensate (83) accumulated in the demister means (80) is periodically drained from the demister means (80) by a condensate drain means (84) comprised generally of a valve and piping means discharging into a reservoir.

13. (Currently amended) An apparatus of claim 12 further comprising:

a. supplemental heat exchanger means (62) is comprised of a tube heat exchanger; fuel means (120) includes but is not limited to diesel, peanut oil, vegetable oils and other combustible substances for engine means (160) combustion/ pump means (140) exerts a vacuum at the fuel conditione output (130) and fuel conditioner output (130) is directed to a storage or combustion at an engine means (160);

b. [V]__valve means controls water or coolant supply inlet (67) and water or

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coolant discharge (69) and the condensate drain (84); pipe or tube means (75) provides fluid communication from fuel gas (44) input to heat exchanger means (60), between heat exchanger means (60) and demister means (80); between demister means (80) and fuel conditioner means (100) and between fuel conditioner means (100) and storage or engine means (160).

14. (Currently amended) An apparatus of claim 13 further comprising:

a. the fuel conditioner output (130) is in the range of 5% to 20% diesel with the balance comprised of fuel gas (44)_;_

b. conditioner means (100) having a fuel conditioner means input (110) from the demister means (80) conveying fuel gas (44); the fuel conditioner means input (110) directing fuel gas (44) through bubble forming means (115) into and through a fuel conditioner means (100) containing fuel means (120);

c. bubble forming means (115) is provided by directing the fuel conditioner input means (110) via pipe or tube means (110) to and through a grid (116)formed of fine wire mesh or a plate with at least one aperture (117.

15. (Currently amended) An apparatus of claim 14 further comprising:

a. the fuel conditioner output (130) will be diesel in the range of 5% to 10% and fuel gas (44) at 95% to 90%;

b. fuel means (120) comprised of diesel, peanut oil, vegetable oils and other combustible substances .

16. (Original) An apparatus of claim 15 further comprising:

a. the conditioned fuel gas (130) is be introduced directly into the engine intake

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manifold.

17. (Original) An apparatus of claim 11 further comprising:

a. the water or coolant discharge (69) is discharged to a reservior for agricultural uses.

18. (Original) A process from the apparatus of claim 17 comprising:

a. collecting the water or coolant discharge (69); separating chemicals from said water or coolant discharge including potassium.

19. (Currently amended) The apparatus of claim 10 further comprising:

a. the upper layer (13) has a upper layer center (12) relative to the upper layer (13) proximal a reaction chamber wall (32) and proximal [the] a reaction chamber top (31);

b. biomass (20) is introduced into the upper layer (13) by means of a funnel means (200) which directs said biomass (20) toward the upper layer center (12);

c. a charcoal discharge funnel means (230) is formed intermediate the lower layer (15) and the removal means (45) which directs the charcoal away from walls (42) of the charcoal removal system (40) and toward the removal means (45);

d. the funnel means (200) at the funnel side (220), relative to a vertical, and the charcoal discharge funnel means (230) at the charcoal discharge funnel slope (240) are sloped at greater than approximately 45 degrees[;].

20. (Original) The apparatus of claim 19 further comprising:

a. the slope, θ (210, 240) of the funnel means (200) funnel side (220) and of the

charcoal discharge funnel slope (240) are approximately 60 degrees; both the funnel means (200) and the charcoal discharge funnel means (230) are primarily inverted conical in structure.

21. (Original) The apparatus of claim 12, further comprising:

a. a charcoal heat exchanger means (260) provided by at least one tube (262) penetrating the charcoal collection means (41) arena via heat exchanger ports (264) at the charcoal removal system wall (42).

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